LG

# COLOR TV
# SERVICE MANUAL

## CHASSIS : 12.4/5

**CAUTION**
BEFORE SERVICING THE CHASSIS,
READ THE SAFETY PRECAUTIONS IN THIS MANUAL.

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## SAFETY PRECAUTIONS

### GENERAL GUIDELINES

1. It is advised to insert an isolation transformer in the AC supply before servicing a hot chassis.

2. Potentials as high as 33KV are present when this receiver is in operation. Operation of the receiver without the rear cover involves the danger of a shock hazard from the receiver power supply. Servicing should not be attempted by any one who is not competent with the precautions necessary when working on the high voltage equipment. Always discharge the anode of the tube.

3. When servicing observe the original lead dress in the high voltage circuits. If a short circuit is found, replace all the parts which have been overheated or damaged by the short circuit.

4. Always use the manufacturer's replacement safety components. The critical safety components marted with ∇ on the schematics diagrams should not te replaced by substitutes. Substitution my create electrical shock, fire or other hazard. Take attention to replace the spacers with the originals.
   Furthermore where a short circuit has occurred, replace those componenets that indicate evidence of overheating.

5. After servicing, see that all the protective devices such as insulation barriers, insulation papers, shields and isolation R-C combinations are correctly installed.

6. When the receiver is not being used for a period of time, unplug the power cord from the AC outlet.

7. After servicing make the following leakage current checks to prevent the customer from being exposed to shock hazard.

### LEAKAGE CURRENT COLD CHECK

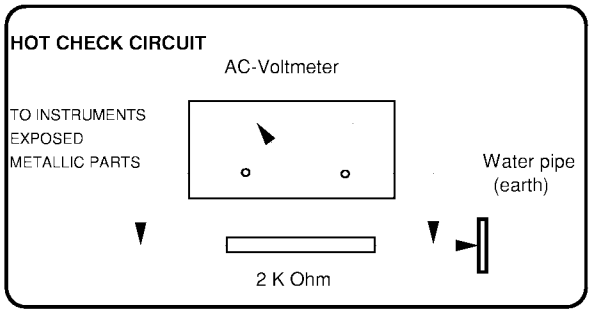
1. Unplug the AC plug and connect a jumper between the live and neutral pins.

2. Push the receiver's power switch.

3. Measure the resistance value with an ohmmeter, between the jumpered AC plug and each exposed metallic cabinet part on the receiver, such as screw heads, aerials, connectors, control shafts etc. When the exposed metallic part has a return path to the chassis the reading should be between aMohm and the 20Mohm. When the exposed metal does not have a return path to the chassis, the reading must be infinite.

### LEAKAGE CURRENT HOT CHECK

1. Plug the AC plug directly in to the AC outlet. Do not use an isolation transformer for this check.
2. Connuct a 2Kohm 10W resistor in series with an exposed metallic part on the receiver and an earth, such as water pipe.
3. Use an AC voltmeter with high impedance to measure the potential across the resistor.
4. Check each exposed metallic part and check the voltage at the each point.
5. The potential at the any point should not exceed 1.4 Vrms. In case a measurement is outside the limits specified, there is the possibility of a shock hazard, and the receiver should be repaired and rechecked before it is returned to the customer.




### X-RAY RADIATION WARNING

The primary source of X-ray radiation in this receiver is the picture tube. The chassis is specially constructed to limit X-ray radiation. For continnued X-ray radiation protection, replace the tube with the same type of the original one.

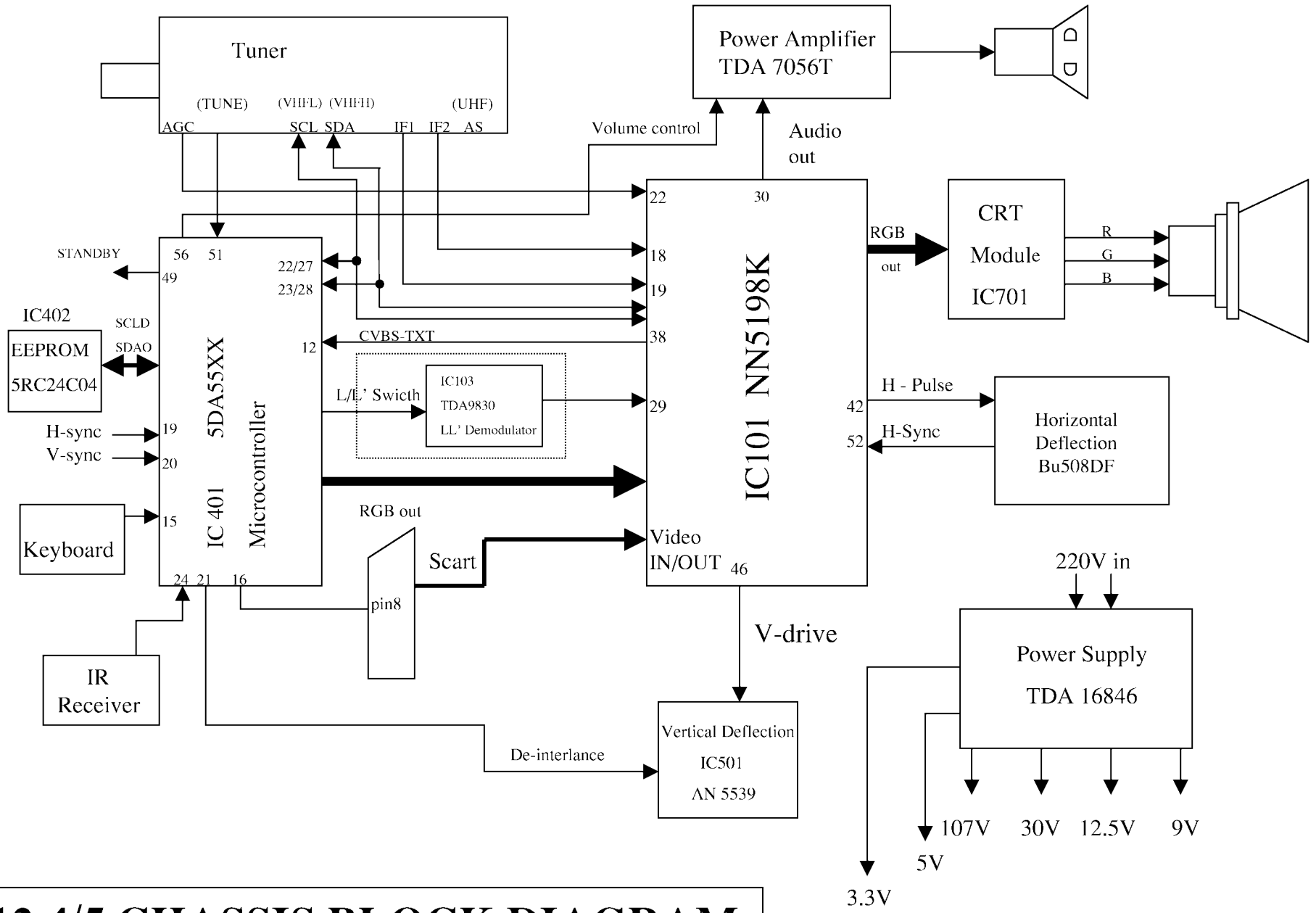
### CAUTION

**SHORT CIRCUIT THE ANODE OF THE PICTURE TUBE AND THE ANODE CAP TO THE METAL CHASSIS, CRT SHIELD, OR THE CARBON PAINTED ON THE CRT, AFTER REMOVAL OF THE ANODE CAP.**

## TECHNICAL SPECIFICATIONS AND THE FEATURES

| | |
|---|---|
| **Power source:** | 220-240V AC, 50-60Hz |
| **Power consumption:** | 65W 14"<br>85W 20"<br>85W 21" |
| **Aerial impedance :** | 75Ohm, Coaxial type |
| **Receiving system*:** | PAL BG<br>PAL SECAM BG<br>PAL SECAM BG DK<br>PAL SECAM BG LL'<br>PAL I |
| **Receiving channels:** | VHF BAND I, CH2-4<br>VHF BAND III, CH5-12<br>CATV CHANNELS S1-S41<br>UHF BAND CH21-69 |
| **Audio outputs :** | 2.5W RMS at %10 THD<br>16 OHM SPEAKER |
| **High Voltage :** | 23KV ±0.5KV<br>25.5KV ±0.5KV |
| **Focus voltage :** | %25.6±%38 of EHT |
| **Grid 2 voltage :** | 0-1400V |
| **Heater voltage :** | 6.3±0.2Vrms |
| **Video/Audio Terminals :** | |
| AV1 IN | Video 1 Vpp, 75Ohm<br>Audio 0.5Vrms, >10Kohm<br>RGB |
| AV1 OUT | Video 1Vpp,75Ohm<br>Audio 0.5Vrms,>1Kohm |
| AV2 IN (RCA-OPTIONAL) | Video 1Vpp,75Ohm<br>Audio 0.5Vrms,>10Kohm |
| **Operating temperature :** | 0-45 Degrees |
| **Safety :** | IEC 65/BS P2N |
| **X-Ray radiation :** | ACC. IEC 65/BS P2N |

• : TV set is produced to receive "one" of these colour and sound systems.




# 12.4/5 CHASSIS BLOCK DIAGRAM

## BASIC SPECIFICATION AND DESCIPTION OF TDA16846 (IC601)

### Description

TheTDA16846 is optimized to control free running or fixed frequency flyback converters with or with-out Power Factor Correction (Current Pump). To provide low power consumption at light loads, this device reduces the switching frequency continuously with load, towards an adjustable minimum (e.g. 20kHz in standby mode). Additionally, the start up current is very low. To avoid switching stresses of the power devices, the power transistor is always switched on at minimum voltage. A special circuit is implemented to avoid jitter. The device has several protection functions: VCC over- and undervoltage, mains undervoltage, current limiting and 2 free usable fault comparators. Regulation can be done by using the internal error amplifier or an opto coupler feedback (additional input). The out-put driver is ideally suited for driving a power MOSFET, but it can also be used for a bipolar transistor.
Fixed frequency and synchronized operation are also possible.

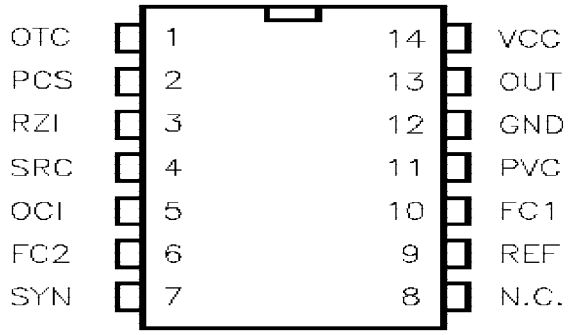
### Pin Description

| Pin | Symbol | Function |
|---|---|---|
| 1 | OTC | Off Time Circuit |
| 2 | PCS | Primary Current Simulation |
| 3 | RZI | Regulation and Zero Crossing Input |
| 4 | SRC | Soft-Start and Regulation Capacitor |
| 5 | OCI | Opto Coupler Input |
| 6 | FC2 | Fault Comparator 2 |
| 7 | SYN | Synchronization Input |
| 8 | | N. C. |
| 9 | REF | Reference Voltage and Current |
| 10 | FC1 | Fault Comparator 1 |
| 11 | PVC | Primary Voltage Check |
| 12 | GND | Ground |
| 13 | OUT | Output |
| 14 | VCC | Supply Voltage |

**Short Description of the Pin Functions**

**Pin 1:** A parallel RC- circuit between this pin and ground determines the ringing suppression time and the standby- frequency.
**Pin 2:** A capacitor between this pin and ground and a resistor between this pin and the anode of the primary elcap quantifies the max. possible output power of the SMPS.
**Pin 3:** This is the input of the error amplifier and the zero crossing input. The output of a voltage divider between the control winding and ground is connected to this input. If the pulses at pin 3 exceed a 5V threshold, the control voltage at pin 4 is lowered.
**Pin 4:** This is the pin for the control voltage. A capacitor has to be connected between this pin and ground. The value of this capacitor determines the duration of the softstart and the speed of the control.
**Pin 5:** If an opto coupler for the control is used, it´s output has to be connected between this pin and ground. The voltage divider at pin 3 has then to be changed, so that the pulses at pin 3 are below 5V.
**Pin 6:** Fault comparator 2: If a voltage > 1.2 V is applied to this pin, the SMPS stops.
**Pin 7:** If fixed frequency mode is wanted, a parallel RC circuit has to be connected between this pin and ground. The RC- value determines the frequency. If synchronized mode is wanted, sync pulses have to be fed into this pin.
**Pin 8:** Not connected.

**Pin 9:** Output for reference voltage (5 V). With a resistor between this pin and ground the fault comparator 2 (pin 6) is enabled.
**Pin 10:** Fault comparator 1: If a voltage > 1 V is applied to this pin, the SMPS stops.
**Pin 11:** This is the input of the primary voltage check. The voltage at the anode of the primary elcap has to be fed to this pin via a voltage divider. If the voltage of this pin falls below 1V, the SMPS is switched off. A second function of this pin is the primary voltage dependent fold back point correction (only active in free running mode).
**Pin 12:** Common ground.
**Pin 13:** Output signal. This pin has to be connected across a serial resistor with the gate of the power transistor.
**Pin 14:** Connection for supply voltage and startup capacitor. After startup the supply voltage is produced by the control winding of the transformer and rectified by an external diode.



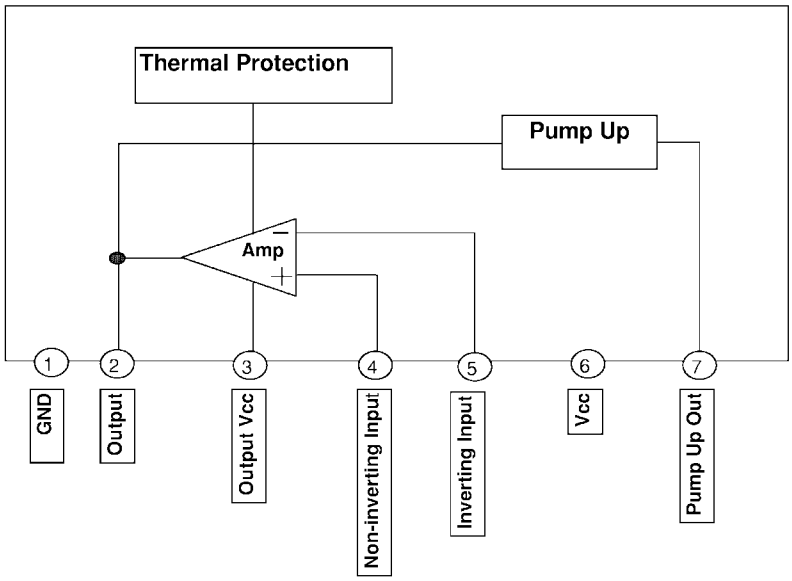

**Absolute maximum ratings**

| Parameter | Symbol | Min | Max | Unit | Remark |
|---|---|---|---|---|---|
| Supply Voltage at Pin 14 | $V_{CC}$ | -0.3 | 17 | V | |
| Voltage at Pin 1, 4, 5, 6, 7, 9, 10 | | -0.3 | 6 | V | |
| Voltage at Pin 2, 8, 11 | | -0.3 | 17 | V | |
| Voltage at Pin 3<br>Current into Pin 3 | RZI | <br>-10 | 6 | V<br>mA | <br>V3 < -0.3V |
| Current into Pin 9 | REF | -1 | | mA | |
| Current into Pin 13 | OUT | <br>-100 | 100 | mA<br>mA | V13 > $V_{CC}$<br>V13 < 0 V |
| ESD Protection | | | | kV | MIL STD 883C method 3015.6, 100pF, 1500Ω |
| Operating Ambient Temperature | $T_A$ | 0 | 70 | °C | |
| Storage Temperature | $T_{stg}$ | -65 | 125 | °C | |
| Operating Junction Temperature | $T_J$ | | 125 | °C | |
| Thermal Resistance Junction-Ambient | $R_{thJA}$ | | | K/W | P-DIP-14-3 |
| Soldering Temperature | | | 260 | °C | |
| Soldering Time | | | 10 | s | |

All voltages listed are referenced to ground (0V, $V_{SS}$) except where noted.

| | IC101 NN5198K/50991K VIDEO CONTROLLER IC | | | | |
|---|---|---|---|---|---|
| PİN NO. | Pin Description | PIN VOLTAGES (VDC) | Pin NO. | Pin Description | PİN VOLTAGES (VDC) |
| 1 | TEST | - | 27 | QIF DETECT OUTPUT | 3.60 |
| 2 | SCL | 2.39 | 28 | SIF INPUT | 3.40 |
| 3 | CHROMA APC FILTER | 5.60 | 29 | EXTERNAL AUDIO INPUT | 3.90 |
| 4 | ABCL | 3.28 | 30 | AUDIO OUTPUT | 4.21 |
| 5 | Ys INPUT | 0.38 | 31 | BLACK LEVEL DETECT FILTER | 4.41 |
| 6 | EXTERNAL R INPUT | 4.85 | 32 | DE - EMPHASIS FILTER/AUDIO MONITOR OUTPUT | 4.32 |
| 7 | EXTERNAL G INPUT | 4.85 | 33 | VCC1 (CHROMA) | 9 |
| 8 | EXTERNAL B INPUT | 5.10 | 34 | VIF DETECT OUTPUT | 5.30 |
| 9 | VCC1 (VCJ) | 9.20 | 35 | VCC3 (DAC) | 4.65 |
| 10 | R OUTPUT | 3.05 | 36 | VIDEO OUTPUT | 5.24 |
| 11 | G OUTPUT | 3.05 | 37 | TEST 2 | 0 |
| 12 | B OUTPUT | 2.95 | 38 | Y INPUT/VERTICAL SYNC, INPUT | 4.18 |
| 13 | GND (VCJ) | 0.12 | 39 | HORIZONTAL SYNC, INPUT | 4.10 |
| 14 | CHROMA VCX 01 (4,43MHz) | 0.24 | 40 | CHROMA VCX 02 (3.58 MHz) | 2.68 |
| 15 | SECAM PLL REF, FILTER | 0.05 | 41 | VCC2 (HORIZONTAL VCC) | 6.15 |
| 16 | VCC1 ( VIF/SIF ) | 9.00 | 42 | HORIZONTAL PULSE OUTPUT | 1.25 |
| 17 | SECAM BELL REF, FILTER | 0.13 | 43 | HORIZONTAL AFC1 FILTER | 3.32 |
| 18 | VIF INPUT (1) | 2.80 | 44 | AUDIO DE - COUPLING FILTER | 3.09 |
| 19 | VIF INPUT (2) | 2.80 | 45 | VERTICAL SAW TOOTH | 1.17 |
| 20 | GND (VIF/SIF) | - | 46 | VERTICAL OUTPUT | 3.20 |
| 21 | QIF INPUT | 2.66 | 47 | VERTICAL AGC FILTER | 3.10 |
| 22 | RF AGC OUTPUT | 4.84 | 48 | VDD1 (CMOS) | 4.97 |
| 23 | AFT OUTPUT | 4.05 | 49 | SCP/CW OUTPUT/X - RAY | 0.68 |
| 24 | EXTERNAL VIDEO/CHROMA INP | 3.14 | 50 | VSS (CMOS) | 0 |
| 25 | IF AGC FILTER | 6.71 | 51 | SDA | 1.85 |
| 26 | VIF APC FILTER | 3.40 | 52 | FBP INPUT | 0.38 |

**AN5539LF**




## Pin Descriptions

| Pin No. | Pin Name |
|---|---|
| 1 | GND |
| 2 | Vertical Output |
| 3 | Vertical Output Power Supply |
| 4 | Non-inverting Input |
| 5 | Inverting Input |
| 6 | Power Supply |
| 7 | Pump-up Output |

| | IC401 SDA5552/SDA5521 MICROCONTROLLER IC | | |
|---|---|---|---|
| PİN NO. | Pin Description | Pin NO. | Pin Description |
| 1 | I/O PIN -open collector | 27 | SDA1-OUT |
| 2 | TV INT- Multimedia mode | 28 | SDA1-IN |
| 3 | ON-LINE-Multimedia mode | 29 | GND |
| 4 | LL' SWITCH | 30 | VDD-3.3V SUPPLY |
| 5 | BAND SELECT (no function for 12.5 models) | 31 | NO CONNECTION |
| 6 | BAND SELECT (no function for 12.5 models) | 32 | NO CONNECTION |
| 7 | LL' AV Selection | 33 | RESET PIN |
| 8 | SERVICE PIN (no fuction for normal operation) | 34 | NO CONNECTION |
| 9 | VDD_2.5 supply pin | 35 | XTAL1- INPUT OF THE INVERTING OSCILLATOR AMPLIFIER |
| 10 | GND | 36 | XTAL2- INPUT OF THE INVERTING OSCILLATOR AMPLIFIER |
| 11 | VDD_3.3 supply pin | 37 | VDD_2.5 supply pin |
| 12 | CVBS-TXT input | 38 | R OUTPUT FOR OSD AND TXT |
| 13 | VDDA_2.5 supply pin | 39 | G OUTPUT FOR OSD AND TXT |
| 14 | GND | 40 | B OUTPUT FOR OSD AND TXT |
| 15 | LOCAL KEYBOARD İNPUT | 41 | FBL OUT |
| 16 | STATUS PIN | 42 | VDDA_2.5 supply pin |
| 17 | AFT | 43 | GND |
| 18 | POWER CTRL | 44 | VDD_3.3 supply pin |
| 19 | HORIZONTAL SYNC INPUT | 45 | AV SELECTION |
| 20 | VERTICAL SYNC INPUT | 46 | RGB SELECTION |
| 21 | ODD/EVEN OUTPUT | 47 | NO CONNECTION |
| 22 | SCL1-OUT | 48 | GND |
| 23 | SCL1-IN | 49 | STAND BY (ON-OFF) PIN |
| 24 | INFRARED RECEIVER INPUT | 50 | NO CONNECTION |
| 25 | SCL0-SDA0 INPUT | 51 | TUNING VOLTAGE (NO CONNECTION FOR 12.5 MODELS) |
| 26 | SCL0-SDA0 INPUT | 52 | VOLUME CONTROL PIN |

**IC103 TDA9830 TV SOUND AM DEMODULATOR AND AUDIO SWITCH**

**FEATURES**

- Adjustment free wideband synchronous AM demodulator
- Audio source-mute switch (low noise)
- Audio level according EN50049
- 5 to 8 V power supply or 12 V alternative
- Low power consumption.

**GENERAL DESCRIPTION**

The TDA9830, a monolithic integrated circuit, is designed for AM-sound demodulation used in L- and L'-standard.
The IC provides an audio source selector and also mute switch.

## PINNING

| SYMBOL | PIN | DESCRIPTION |
|---|---|---|
| IFIN | 1 | sound IF differential input signal |
| n.c. | 2 | not connected |
| $C_{AGC}$ | 3 | AGC capacitor |
| $C_{REF}$ | 4 | REF voltage filtering capacitor |
| n.c. | 5 | not connected |
| AMOUT | 6 | AM demodulator output |
| AMIN | 7 | input signal (from AM) to audio switch |
| AFOUT | 8 | output signal from audio switch |
| EXTIN | 9 | input signal (from external) to audio switch |
| SWITCH | 10 | switch input select control |
| $V_{P2}$ | 11 | Supply voltage +12 V (alternative) |
| MUTE | 12 | mute control |
| GND | 13 | ground (0 V) |
| $V_{P1}$ | 14 | supply voltage +5 to +8 V |
| n.c. | 15 | not connected |
| IFIN | 16 | sound IF differential input signal |

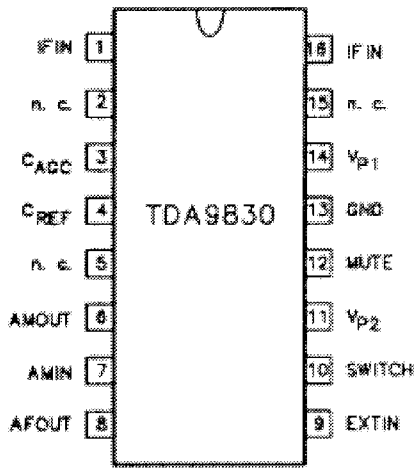



Fig.2 Pin configuration.

## ELECTRICAL ADJUSTMENTS

**ENTERING THE SERVICE MODE:** You need the special remote control to enter and exit the service menu of the TV (you can order it from manufacturer). All buttons of service RC are same with user remote control, only service in/out key was added to the service remote control.

For multimedia models : you have to enter 7,5,9 and 2 while the picture menu is displayed to enter service menu. Press "0" to exit from service menu.

### 1-POWER SUPPLY VOLTAGE

Connect a digital voltmeter to the cathode of D610 diode at the AV1 mode of the TV and set the screen voltge to the minumum. Adjust the main supply voltage +B with P601 potentiometer to the following voltage value.

| | | |
|---|---|---|
| 14 inch | A33LPE02X01 | 106V DC |
| 20 inch | A4ECR143X51 | 118V DC |
| 21 inch | A51EER 133X41 | 118V DC |

Adjust the screen potentiometer to the level where a picture is just visible.

### 2- INTERMEDIATE FREQUENCY ADJUSTMENTS

Before starting this adjustment follow this procedure:

Enter service mode, change "VIDEO" header to "NEW". Then exit from service mode.

**ATTENTION!!! : Above procedure must be done after replacing the Video IC (IC101) or EEPROM IC. IF adjustment must be repeated after "VIDEO" header displays "NEW".**

**For BG, DK, I standard**: Adjust the frequency of pattern generator to the 38.9Mhz and switch it to colour bar pattern. Connect the RF output of pattern generator to the pin 1 of F101. Enter service mode. Adjust the "AFT38" item of service menu to read the voltage value 1.45VDC +-100mV DC at the pin#23 of IC101. Exit from service mode.

**For SECAM LL' Standart :** Adjust the frequency of pattern generator to the 33.9 MHz and switch it to colour bar pattern. Connect the RF output of pattern generator to the pin 1 of F101. Enter service mode. Adjust the "AFT33"item of service menu to read the voltage value 1.45VDC ± 100mV DC at the pin#23 of IC101. Exit from service mode.

### 3-AGC ADJUSTMENTS

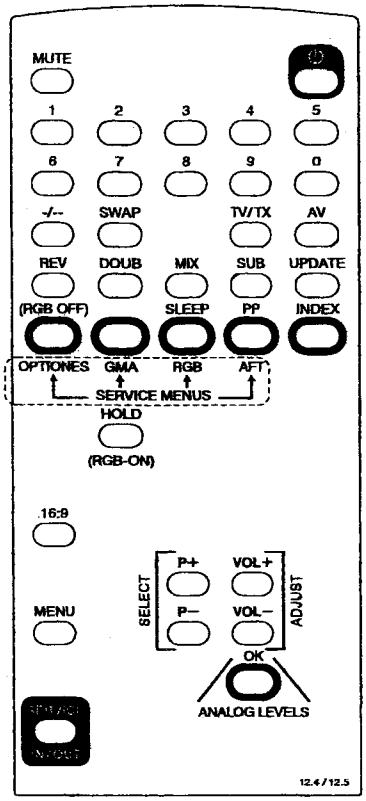
Apply a signal at the channel 32 with 32 with 60±1dBuV level to the antenna input (switch sound carrier Off and switch "Video Ext" On).

Connect an oscilloscope to the pin#11 (IF2) of Tuner and ground.

Enter service mode and go "AGC" header.

Adjust the amplitude to the value given below (which is monitored on oscilloscope) using the Volume+/Volume- key of remote control.

| | | |
|---|---|---|
| **12.5 chassis for BG,DK,I** | **Standards:** | 630mVpp±20mVpp |
| **12.5 chassis for LL'** | **Standards:** | 450mVpp±20mVpp |
| **12.4 chassis for BG,DK,** | **Standards:** | 630mVpp±20mVpp |
| **12.4 chassis for LL'** | **Standards:** | 450mVpp±20mVpp |
| **12.4 chassis for I'** | **Standards:** | 500mVpp±20mVpp |




Service Remote Control

## 4- SERVICE MODE SETUP

| ITEM | SELECTION |
|---|---|
| TUNER | SHARP&ALPS<br>PHILLIPS<br>P.SONIC<br>TEMIC<br>FULL BAND<br>UHF ONLY |
| FULL BAND and UHF ONLY | items are valid only for 12.4 (voltage synthezirs) chassis. |
| **AV2** | NO: Single scart<br>YES: Single scart+front AV |
| **CLR.S** | PAL<br>PAL/NTSC : SECAM is iden tified automatically. |
| **SND.S** | BG<br>I<br>BG+DK<br>BG+LL' |
| **TEXT** | DEFAULT : Teletext<br>FASTEXT : Fastext |

## 4- GEOMETRY ADJUSTMENTS

Enter service mode. Select Green Button in Service Menu. "H.POS" is for horizontal position, "V.HEI" is for vertical size, "LNRTY" is for vertical linearity, "S.COR" is for S-correction adjustment.

## 5- SCREEN ADJUSTMENT

Enter service mode. Select Yellow Button in Service Menu. Select "SCRN" item. Press Vol + or - button. You will see white horizontal line at center of the screen. Adjust the screen potentiometer to the just visiable level of horizontal line. Return to PICTURE MODE by pressing VOL+

## 6- WHITE BALANCE ADJUSTMENT

Enter the service mode. Select Yellow Button in Service Menu. Select and adjust "G.CUT" to the 128. Adjust "R.CUt" and "B.CUT" for cut off adjustment. Select and adjust "R.DRV" and "B.DRV" for white balace. Exit from service mode.

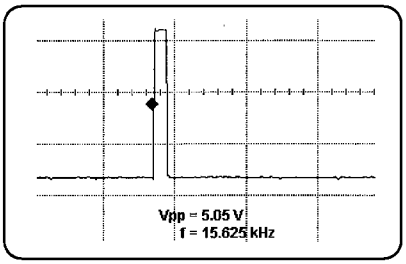
## 7- PRESET VALUES OF SERVICE MENU ITEMS

**Below given values are average values and can vary according to the CRT type and chassis type.**

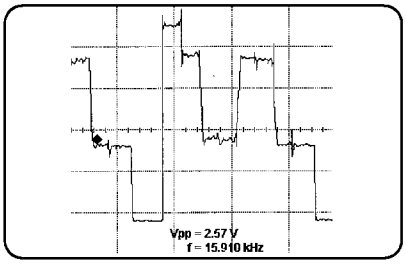
| | RED Menu Button | | | GREEN Menu Button | | | | | | YELLOW Menu Button | | | | | | | BLUE Menu Button | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SIZE | AGC | ST.BY | VIDEO | H.POS | V.POS | V.HEI | LNRTY | S.COR | Y.DLY | G.CUT | R.CUT | B.CUT | R.DRV | B.DRV | SCRN | SECBL | AFT38 | AFT33 |
| 14" | 19 | NO | OLD | 14 | 4 | 64 | 46 | 0 | 1 | 128 | 127 | 124 | 59 | 53 | 0 | 48 | 40 | 61 |
| 20" | 19 | NO | OLD | 13 | 4 | 80 | 47 | 0 | 1 | 128 | 128 | 119 | 58 | 59 | 0 | 48 | 40 | 61 |
| 21" | 19 | NO | OLD | 14 | 4 | 81 | 47 | 0 | 1 | 128 | 128 | 121 | 55 | 56 | 0 | 48 | 40 | 61 |

# WAVE FORMS

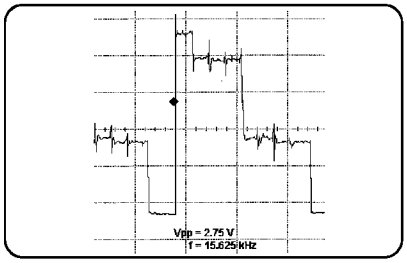
## 1. IC 101 (NN 5198K)



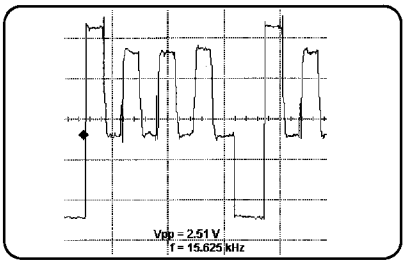

Pin no: 5 (OSD ON)



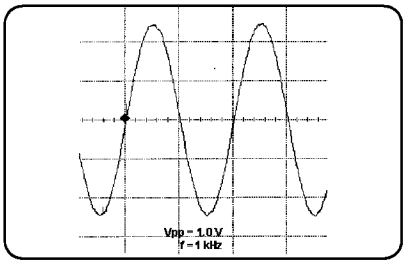

Pin no: 10



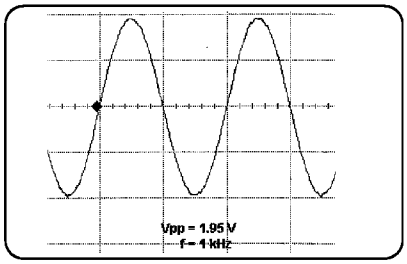

Pin no: 11



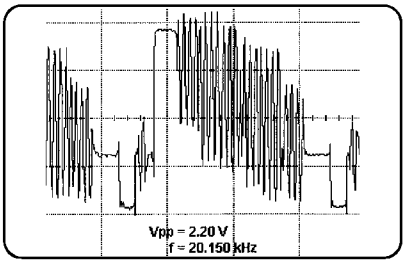

Pin no: 12



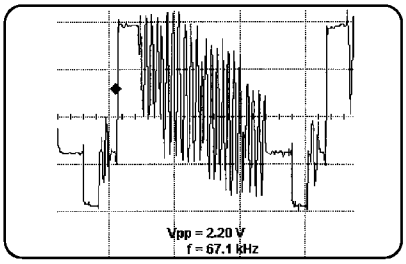

Pin no: 30




Pin no: 32




Pin no: 34

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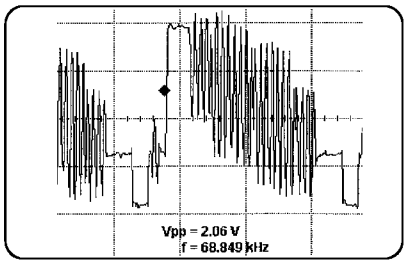
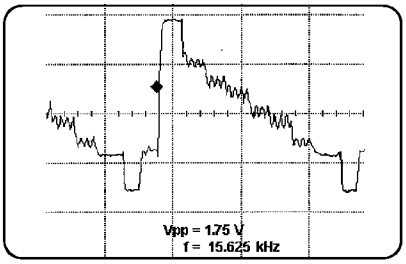



Pin no: 38

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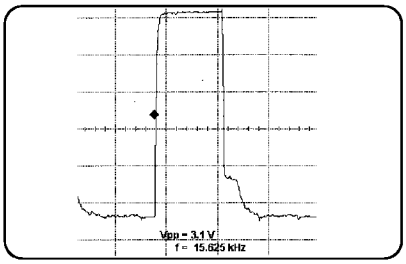
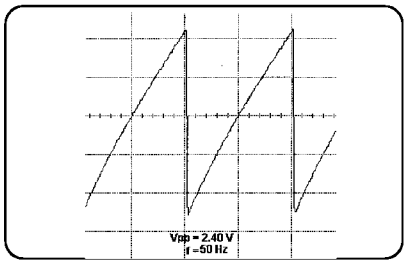
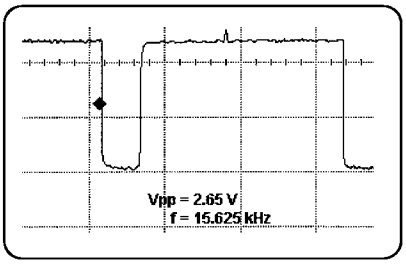



Pin no: 42

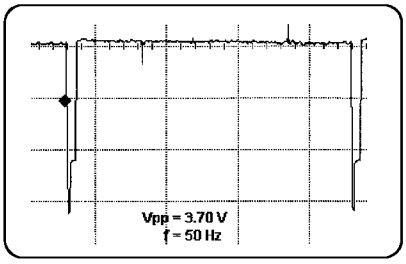



Pin no: 46

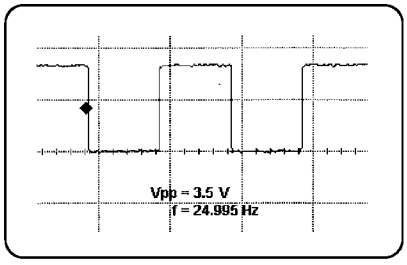
## 2. IC 401 (SDA 555XL)



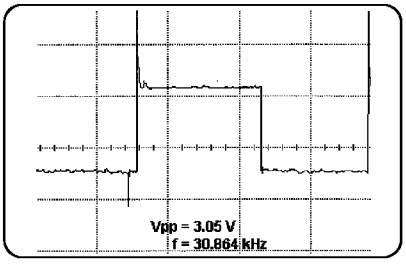

Pin no: 19



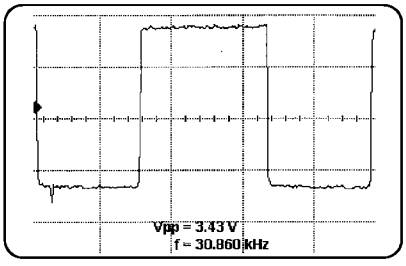

Pin no: 20



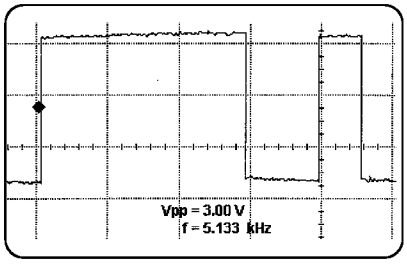

Pin no: 21



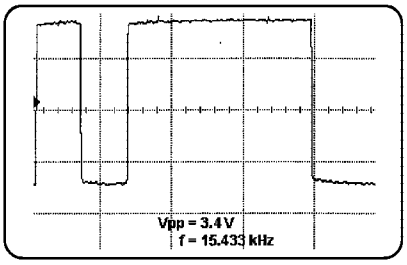

Pin no: 22



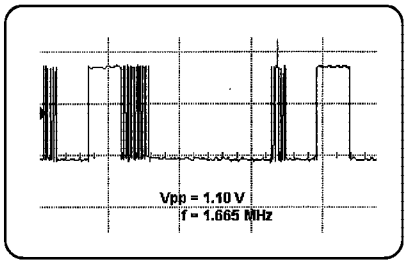

Pin no: 23




Pin no: 27




Pin no: 28

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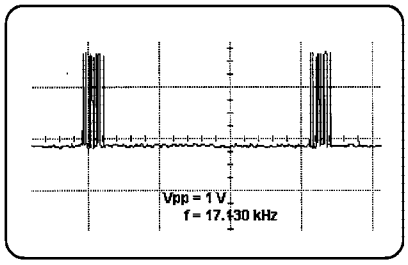


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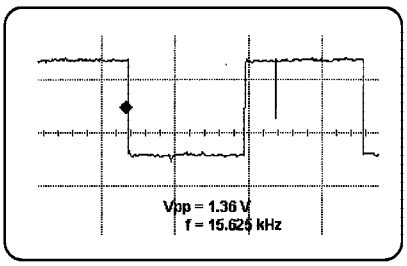
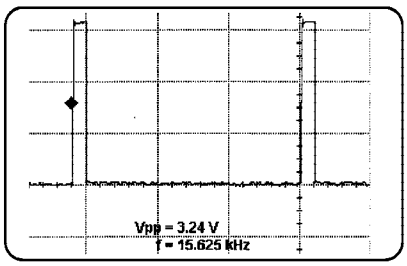
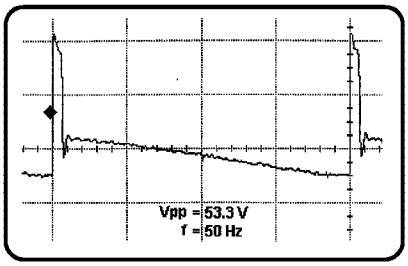



Pin no: 40

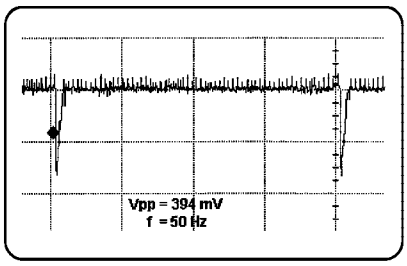



Pin no: 41

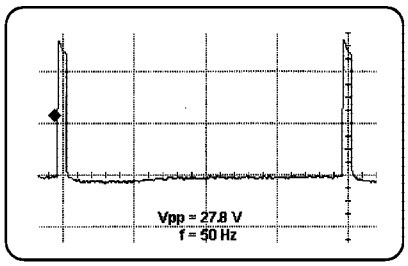
### 3. IC 501 (AN 5539)




Pin no: 2

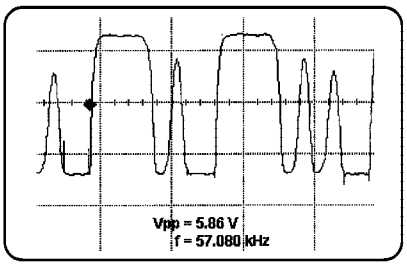



Pin no: 5

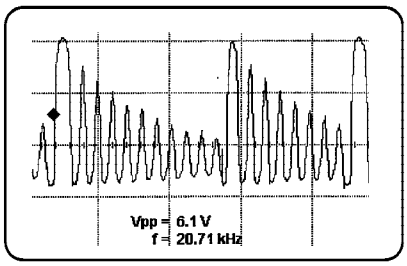



Pin no: 7

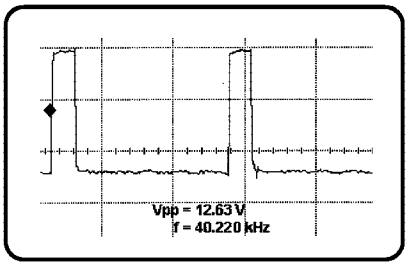
### 4. IC 601 (TDA 16846)



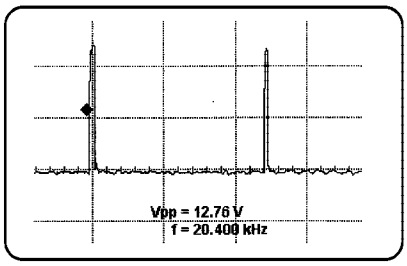

Pin no: 3 (TV ON)




Pin no: 3 (TV Stand-By)

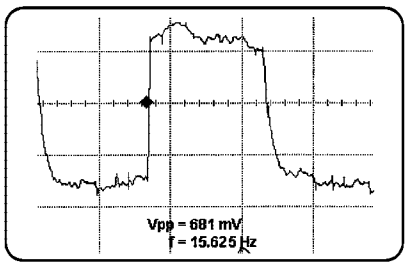



Pin no: 13 (TV ON)



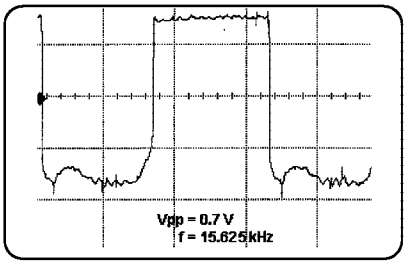

Pin no: 13 (TV Stand-By)

### 5. T 503 (BC 848 NPN)



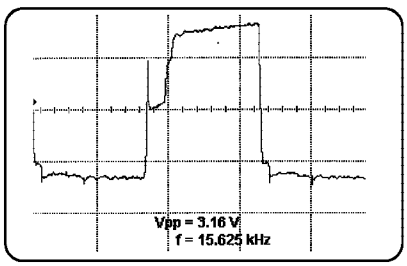

Base

### 6. T 504 (BC 848 NPN)



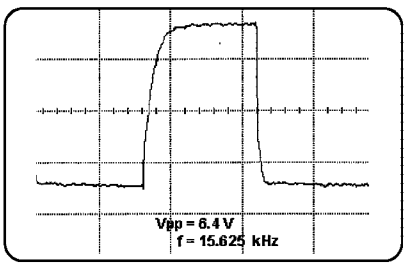

Base

### 7. T 505 (2 SK3065)




Drain

### T 505 (2 SK3065)




Gate

## CONVERGENCE ADJUSTMENTS

**Note:** Before attempting any convergence adjustments, the receiver should be operated for at least fifteen minutes.

### • Centre Convergence Adjustment

1. Receive crosshatch pattern with a colour bar signal generator.
2. Adjust the BRIGHTNESS and CONTRAST Controls for well defined pattern.
3. Adjust two tabs of the 4-Pole Magnets to change the angle between them (See figure 16) and superimpose red and blue vertical lines in the centrel area of the picture screen. (See figure).
4. Turn the both tabs at the same time keeping the constant angle to superimpose red and blue horizontal lines at the centre of the screen. (See figure)
5. Adjust two tabs of 6-Pole Magnets to superimpose red/blue line and green one. Adjusting the angle affects the vertical lines and rotating both magnets affects the horizontal lines.
6. Repeat adjustments 3,4,5 to ensure best convergence, the adjustment must be undertaken with great care because of the interaction between 4 and 6 pole magnets.

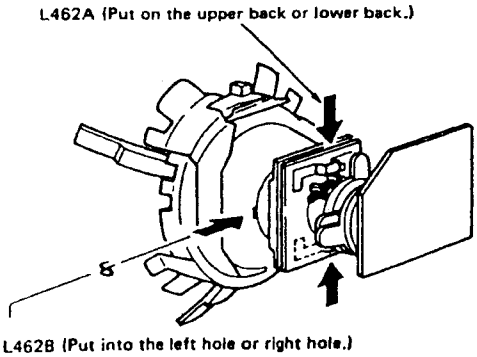
### • Circumference Convergence Adjustment

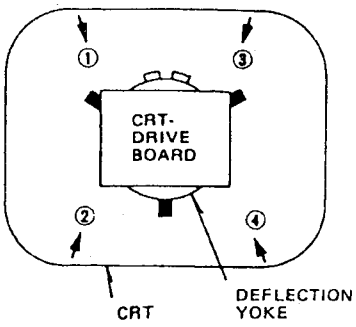
1. Loosen the clamping screw of deflection yoke to allow the yoke to tilt.
2. Put a wedge as shown in figure 15 temporarily. (Do not remove cover paper on adhesive part of the wedge.)
3. Tilt front of the deflection yoke up or down to obtain better convergence in circumference. (See figure) Push the mounted wedge into the space between picture tube and the yoke to fix the yoke temporarily.
4. Put other wedge into bottom space and remove the cover paper to stick.
5. Tilt front of the yoke right or left to obtain better convergence in circumference. (See figure)
6. Keep the yoke position and put another wedge in either upper space. Remove cover paper and stick the wedge on picture tube to fix the yoke.
7. Detach the temporarily mounted wedge and put it in another upper space. Stick it on picture tube to fix the yoke.
8. After fixing three wedges, recheck overall convergence. Tighten the screw firmly to fix the yoke and check the yoke is firm.
9. Stick 3 adhesive tapes on wedges.

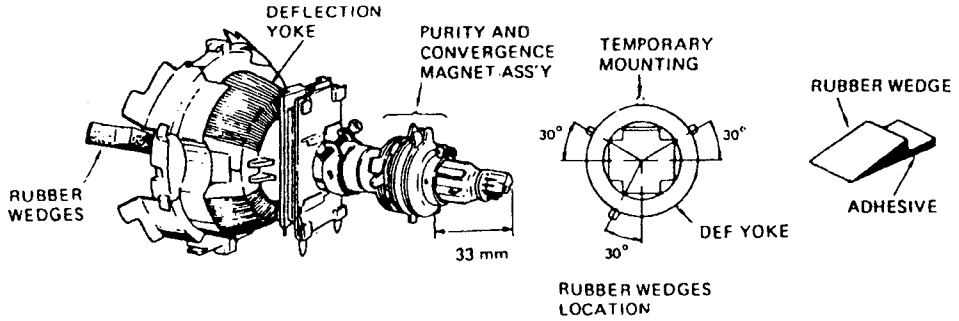
## CONVERGENCE COMPENSATOR

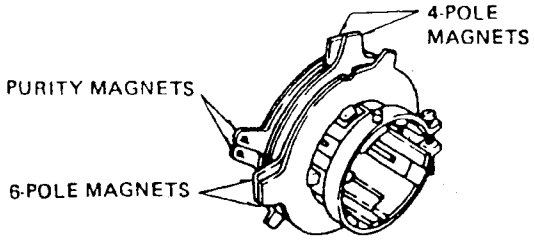
Compensators L462A and L462B are used to correct misconvergence (Red-Green) at the top center or bottom center on screen, when the misconvergence is still evident even though the yoke adjustment is tried. Compensator L462C is also used to correct misconvergence (Vertical shift of Red or Blue) at four corners on screen.

1. To correct horizontal misconvergence (Red-Green), put compensator L462A on the yoke back (see figure right) to find a position for minimizing misconvergence. Mark the position and remove protective paper on the rear of L462A to stick it in place. Apply adhesives on buth yoke and L462A.
2. To correct vertical misconvergence (Red-Green), put the tips of compensator L462B into either of the holes on the yoke core and apply adhesives.
3. To correct up or down shift of Red at top right or bottom right corner, put compensator L462C at point 1 ve 2 or the pisture tube (see figure right.) to find a position for minimizing misconvergence. Mark the position and remove protective paper on the rear of L462C to stick it in place.

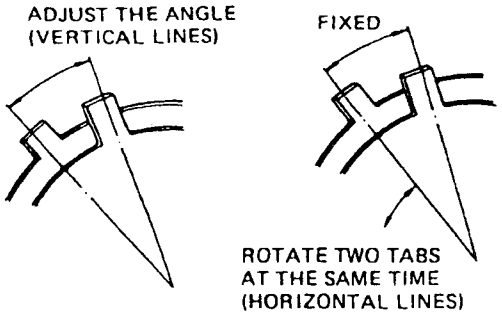


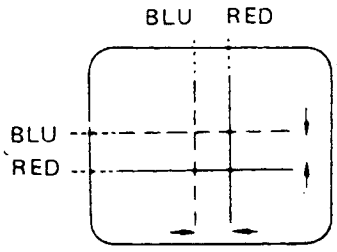



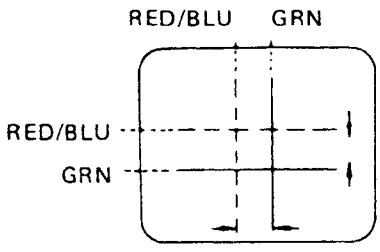

CONVERGENCE MAGNET ASSEMBLY




ADJUSTMENT OF MAGNETS

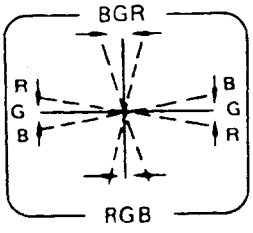



4-POLE MAGNETS MOVEMENT

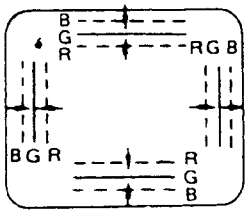



6-POLE MAGNETS MOVEMENT

Centre Convergence by Convergence Magnets




INCLINE THE YOKE UP (OR DOWN)




INCLINE THE YOKE RIGHT (OR LEFT)

Circumference Convergence by DEF Yoke

**Dot Movement Pattern**

## CHANNEL FRQENCY TABLE (BG,I,DK,LL')

| CHANNEL NO | BG | I | DK | L/L' | | | |
|---|---|---|---|---|---|---|---|
| CH1 | | 49.75 | 49.75 | 47.75 | | | |
| CH2 | 48.25 | 59.25 | 59.25 | 55.75 | | | |
| CH3 | 55.25 | 77.25 | 77.25 | 60.50 | | | |
| CH4 | 62.25 | 85.25 | 85.25 | 63.75 | | | |
| CH5 | 175.25 | 93.25 | 93.25 | 176.00 | | | |
| CH6 | 182.25 | 175.25 | 175.25 | 184.00 | | | |
| CH7 | 189.25 | 183.25 | 183.25 | 192.00 | | | |
| CH8 | 196.25 | 191.25 | 191.25 | 200.00 | | | |
| CH9 | 203.25 | 199.25 | 199.25 | 208.00 | | | |
| CH10 | 210.25 | 207.25 | 207.25 | 216.00 | | | |
| CH11 | 217.25 | 215.25 | 215.25 | 189.25 | | | |
| CH12 | 224.25 | 223.25 | 223.25 | 182.25 | | | |
| CH13 | 53.75 | 45.75 | | 196.25 | | | |
| CH14 | 62.25 | 53.75 | | 210.25 | | | |
| CH15 | 82.25 | 61.75 | | | | | |
| CH16 | 175.25 | 69.75 | | | | | |
| CH17 | 183.25 | 95.25 | | | | | |
| CH18 | 192.25 | | | | | | |
| CH19 | 201.25 | | | | | | |
| CH20 | 210.25 | | | | | | |
| CH21 | 471.25 | 471.25 | 471.25 | 471.25 | | | |
| CH22 | 479.25 | 479.25 | 479.25 | 479.25 | | | |
| CH23 | 487.25 | 487.25 | 487.25 | 487.25 | | | |
| CH24 | 495.25 | 495.25 | 495.25 | 495.25 | | | |
| CH25 | 503.25 | 503.25 | 503.25 | 503.25 | | | |
| CH26 | 511.25 | 511.25 | 511.25 | 511.25 | | | |
| CH27 | 519.25 | 519.25 | 519.25 | 519.25 | | | |
| CH28 | 527.25 | 527.25 | 527.25 | 527.25 | | | |
| CH29 | 535.25 | 535.25 | 535.25 | 535.25 | | | |
| CH30 | 543.25 | 543.25 | 543.25 | 543.25 | | | |
| CH31 | 551.25 | 551.25 | 551.25 | 551.25 | | | |
| CH32 | 559.25 | 559.25 | 559.25 | 559.25 | | | |
| CH33 | 567.25 | 567.25 | 567.25 | 567.25 | | | |
| CH34 | 575.25 | 575.25 | 575.25 | 575.25 | | | |
| CH35 | 583.25 | 583.25 | 583.25 | 583.25 | | | |
| CH36 | 591.25 | 591.25 | 591.25 | 591.25 | | | |
| CH37 | 599.25 | 599.25 | 599.25 | 599.25 | | | |
| CH38 | 607.25 | 607.25 | 607.25 | 607.25 | | | |
| CH39 | 615.25 | 615.25 | 615.25 | 615.25 | | | |
| CH40 | 623.25 | 623.25 | 623.25 | 623.25 | | | |
| CH41 | 631.25 | 631.25 | 631.25 | 631.25 | | | |
| CH42 | 639.25 | 639.25 | 639.25 | 639.25 | | | |
| CH43 | 647.25 | 647.25 | 647.25 | 647.25 | | | |
| CH44 | 655.25 | 655.25 | 655.25 | 655.25 | | | |
| CH45 | 663.25 | 663.25 | 663.25 | 663.25 | | | |
| CH46 | 671.25 | 671.25 | 671.25 | 671.25 | | | |
| CH47 | 679.25 | 679.25 | 679.25 | 679.25 | | | |
| CH48 | 687.25 | 687.25 | 687.25 | 687.25 | | | |
| CH49 | 695.25 | 695.25 | 695.25 | 695.25 | | | |
| CH50 | 703.25 | 703.25 | 703.25 | 703.25 | | | |
| CH51 | 711.25 | 711.25 | 711.25 | 711.25 | | | |
| CH52 | 719.25 | 719.25 | 719.25 | 719.25 | | | |
| CH53 | 727.25 | 727.25 | 727.25 | 727.25 | | | |
| CH54 | 735.25 | 735.25 | 735.25 | 735.25 | | | |
| CH55 | 743.25 | 743.25 | 743.25 | 743.25 | | | |
| CH56 | 751.25 | 751.25 | 751.25 | 751.25 | | | |
| CH57 | 759.25 | 759.25 | 759.25 | 759.25 | | | |
| CH58 | 767.25 | 767.25 | 767.25 | 767.25 | | | |
| CH59 | 775.25 | 775.25 | 775.25 | 775.25 | | | |

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|---|---|---|---|---|---|---|---|
| CH60 | 783.25 | 783.25 | 783.25 | 783.25 | | | |
| CH61 | 791.25 | 791.25 | 791.25 | 791.25 | | | |
| CH62 | 799.25 | 799.25 | 799.25 | 799.25 | | | |
| CH63 | 807.25 | 807.25 | 807.25 | 807.25 | | | |
| CH64 | 815.25 | 815.25 | 815.25 | 815.25 | | | |
| CH65 | 823.25 | 823.25 | 823.25 | 823.25 | | | |
| CH66 | 831.25 | 831.25 | 831.25 | 831.25 | | | |
| CH67 | 839.25 | 839.25 | 839.25 | 839.25 | | | |
| CH68 | 847.25 | 847.25 | 847.25 | 847.25 | | | |
| CH69 | 855.25 | 855.25 | 855.25 | 855.25 | | | |
| CH70 | | | | 863.25 | | | |
| CH71 | | | | | | | |
| CH72 | | | | | | | |
| CH73 | | | | | | | |
| CH74 | 69.25 | | | | | | |
| CH75 | 76.25 | | | | | | |
| CH76 | 83.25 | | | | | | |
| CH77 | 90.25 | | | | | | |
| CH78 | 97.25 | | | | | | |
| CH79 | 59.25 | | | | | | |
| CH80 | 93.25 | | | | | | |
| S1 | 105.25 | 103.25 | 103.25 | 116.75 | | | |
| S2 | 112.25 | 111.25 | 111.25 | 128.75 | | | |
| S3 | 119.25 | 119.25 | 119.25 | 140.75 | | | |
| S4 | 126.25 | 127.25 | 127.25 | 152.75 | | | |
| S5 | 133.25 | 135.25 | 135.25 | 164.75 | | | |
| S6 | 140.25 | 143.25 | 143.25 | 176.75 | | | |
| S7 | 147.25 | 151.25 | 151.25 | 188.75 | | | |
| S8 | 154.25 | 159.25 | 159.25 | 200.75 | | | |
| S9 | 161.25 | 167.25 | 167.25 | 212.75 | | | |
| S10 | 168.25 | 231.25 | 231.25 | 224.75 | | | |
| S11 | 231.25 | 239.25 | 239.25 | 236.75 | | | |
| S12 | 238.25 | 247.25 | 247.25 | 248.75 | | | |
| S13 | 245.25 | 255.25 | 255.25 | 260.75 | | | |
| S14 | 252.25 | 263.25 | 263.25 | 272.75 | | | |
| S15 | 259.25 | 271.25 | 271.25 | 284.75 | | | |
| S16 | 266.25 | 279.25 | 279.25 | 296.75 | | | |
| S17 | 273.25 | 287.25 | 287.25 | 55.75 | | | |
| S18 | 280.25 | 295.25 | 295.25 | 60.50 | | | |
| S19 | 287.25 | 303.25 | 303.25 | 63.75 | | | |
| S20 | 294.25 | | | | | | |
| S21 | 303.25 | | | 303.25 | | | |
| S22 | 311.25 | 311.25 | 311.25 | 311.25 | | | |
| S23 | 319.25 | 319.25 | 319.25 | 319.25 | | | |
| S24 | 327.25 | 327.25 | 327.25 | 327.25 | | | |
| S25 | 335.25 | 335.25 | 335.25 | 335.25 | | | |
| S26 | 343.25 | 343.25 | 343.25 | 343.25 | | | |
| S27 | 351.25 | 351.25 | 351.25 | 351.25 | | | |
| S28 | 359.25 | 359.25 | 359.25 | 359.25 | | | |
| S29 | 367.25 | 367.25 | 367.25 | 367.25 | | | |
| S30 | 375.25 | 375.25 | 375.25 | 375.25 | | | |
| S31 | 383.25 | 383.25 | 383.25 | 383.25 | | | |
| S32 | 391.25 | 391.25 | 391.25 | 391.25 | | | |
| S33 | 399.25 | 399.25 | 399.25 | 399.25 | | | |
| S34 | 407.25 | 407.25 | 407.25 | 407.25 | | | |
| S35 | 415.25 | 415.25 | 415.25 | 415.25 | | | |
| S36 | 423.25 | 423.25 | 423.25 | 423.25 | | | |
| S37 | 431.25 | 431.25 | 431.25 | 431.25 | | | |
| S38 | 439.25 | 439.25 | 439.25 | 439.25 | | | |
| S39 | 447.25 | 447.25 | 447.25 | 447.25 | | | |
| S40 | 455.25 | 455.25 | 455.25 | 455.25 | | | |
| S41 | 463.25 | 463.25 | 463.25 | 463.25 | | | |

# PART LIST

| PART NO | DESCRIPTION | | POSIT | ION | NMBERS | | |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| A99136-PH1 | TUNER PH ASIMETRIK UV1316/A | VOLTAGE | TU101 | | | | |
| 7RZ136-PH3 | TUNER PH ASIMETRIK UV1316/ALG-3 | FREQUENCY | TU102 | | | | |
| 010860 | TACT SW LONG STEN | | SW401 | SW402 | SW403 | | |
| 010861 | ON/OFF SWITCH BK98 | | SW601 | | | | |
| 031166 | CONN.CINCH 12.1 FRONT-AV WH | | X0003 | | | | |
| 031176 | CONN.CINCH 12.1 FRONT-AV YE | | X0002 | | | | |
| 031180 | CONN.HEADPHONE 12.1 FRONT-A | | X0004 | | | | |
| 031206 | CONN.HOUS.5P 2317-5S JST B | | X251 | | | | |
| 031229 | SCART SOCKET 11.1 | | SK101 | | | | |
| 031370 | CON.HOUSING X2.5TMK 2904 B | | X251 | | | | |
| 031532 | CRT SOCKET NARROW INCHANG | | X703 | | | | |
| 031675 | CON.HOUSING 2P MALE | | X602 | | | | |
| 031777 | CON.HOUSING LOCKED 5/4 | | X502 | | | | |
| 031780 | CONN.HOUSING 2'LI GREY | | X501 | | | | |
| 031856 | CONN.HOUSING X2003 BLACK | | X102 | | | | |
| 051585 | COIL H-LIN 70UH | | L501 | | | | |
| 051687-02 | LINE FILTER 27MH E-TYPE OPE | | L601 | | | | |
| 053331 | COIL 10UH LAL02 | | L101 | | | | |
| 053352 | COIL- CHOKE 10UH R0814 14.1 | | L701 | | | | |
| 053500 | COIL 10UH K AXIAL LAL04 | | L401 | L402 | L403 | | |
| 053711 | COIL 10UH K (TAIYO) LAL03 | | L0003 | | | | |
| 053719 | COIL CHIP 1UH | | L106 | | | | |
| 053735 | COIL-CHIP 18UH K /12 | | L010 | | | | |
| 053739 | COIL CHOKE 50UH | | L603 | | | | |
| 053759 | COIL 100UH LAL03 | | L604 | | | | |
| 053781 | COIL 2.2UH LAL04 | | L502 | | | | |
| 053782 | COIL 47UH K LAL04 | | L104 | L105 | | | |
| 054261 | FUSE 2.5AT (215 SER.) | | F601 | | | | |
| 055139 | CHOKE COIL 50MHZ 600R PH-WB | | L0001 | L0002 | | | |
| 056210 | CER.RESONATOR GSB455E | | | | | | |
| 056314-EK2 | CPT EK A33LPE 02X01 | 14" | | | | | |
| 056520-SB1 | CPT SEB A48ECR43X51 | 20" | | | | | |
| 056321-SB7 | CPT SEB A51ERR 131X41 | 21" | | | | | |
| 056660 | CRYSTAL 3.579545 90OHM BULK | | Q102 | | | | |
| 056723 | CRYSTAL 4.433619MHZ | | Q101 | | | | |
| 056760 | SAW FILTER OFW J1956M | | F101 | | | | |
| 056961 | CRYSTAL 6.00MHZ | | Q401 | | | | |
| 058413 | FBT 14" 12.1 | 14" | | | | | |
| 058013 | FBT 20/21" 12.1 | 20"-21" | TR501 | | | | |
| 059413 | SMPS 14" 12.1 | 14" | | | | | |
| 059013 | SMPS 20/21" 12.1 | 20"-21" | TR601 | | | | |
| 100220 | CFR 22R J 1/2W 52MM | | R611 | | | | |
| 101106 | CFR 100R J 1/4W 52MM | | R146 | R143 | R148 | | |
| 101221 | CFR 220R J 1/2W 52MM | | R0001 | R0003 | | | |
| 101223 | CFR 220R J 1/4W 52MM | | R147 | | | | |
| 101274 | CFR 270R J 1/4W /6 52MM | | R156 | | | | |
| 101471 | CFR 470R J 1/2W /9 52MM | | R504 | R0005 | R528 | | |
| 102141 | CFR 1K J 1/4W /6 26MM | | R205 | R208 | R210 | R0002 | R0004 |
| 102159 | CFR 1.5K J 1/2W /9 52MM | | R711 | R713 | R715 | R716 | |
| 102338 | CFR 3.3K J 1/4W /6 52MM | | R492 | | | | |
| 103116 | CFR 10K J 1/4W /6 52MM | | R137 | | | | |
| 103136 | CFR 10K J 1/4W /6 26MM | | R622 | R531 | R466 | | |
| 103475 | CFR 47K J 1/4W /6 52MM | | R705 | | | | |
| 110823 | RMO 82R J 3W R:20 | | R526 | | | | |
| 113180 | RMO 18K J 1W | | R620 | | | | |
| 113225 | RM 22K J 1/2W 52MM | | R522 | | | | |
| 113683 | RMO 68K J 1.5W 73MM | | R612 | | | | |
| 115103 | RM 1M J 1W 52MM | | R602 | | | | |
| 115391 | RM 3.9M J 1W 52MM | | R601 | | | | |

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|---|---|---|---|---|---|---|---|
| 115470 | RM 4.7M J 1/2W 52MM | | R615 | | | | |
| 119109 | RNF 0.1R J .4W (UFLB) 52MM | | R623 | | | | |
| 119227-01 | RMF 2.2R J 1W | | R133 | | | | |
| 119271 | RM 2.7R J 1/2W | | R509 | R512 | | | |
| 119337 | RMO 3.3R J 2W R:27.5 TAPE | | R521 | | | | |
| 119478 | RMF .47R J 1W | | R530 | | | | |
| 120234 | RMF 22R J 1/2W | | R640 | | | | |
| 132209 | R-VAR 2.2K (V) 5*3 | | P601 | | | | |
| 154216 | NTC 5.1R M (S234R) | | R608 | | | | |
| 170102 | RC-CHIP 10R J 1/8W /1206 | | R019 | | | | |
| 170683 | RC-CHIP 68R J 1/10W /0805 | | R206 | | | | |
| 170750 | RC-CHIP 75R J 1/10W /0805 | | R010 | | | | |
| 170752 | CFR-CHIP 75R J 1/8W /1206 | | R203 | R204 | R216 | R218 | R202 |
| 171102 | RC-CHIP 100R J 1/10W /0805 | | R145 | R173 | R437 | R438 | R440 |
| 171150 | RC-CHIP 150R J 1/10W /0805 | | R021 | R401 | R416 | | |
| 171240 | RC-CHIP 240R %1 1/10W /0805 | | R618 | R619 | | | |
| 171270 | RC-CHIP 270R J 1/10W /0805 | | R419 | | | | |
| 171332 | RC-CHIP 330R J 1/10W /0805 | | R168 | R462 | | | |
| 171394 | RC-CHIP 390R %1 1/10W /0805 | | R616 | | | | |
| 171471 | RC-CHIP 470R J 1/10W /0805 | | R167 | R175 | R433 | R442 | R450 |
| 171560 | RC-CHIP 560R J 1/10W /0805 | | R209 | R207 | | | |
| 171685 | RC-CHIP 680R J 1/10W 0805 | | R524 | R410 | R463 | | |
| 172101 | RC-CHIP 1K J 1/10W /0805 | | R415 | R425 | R426 | R496 | R136 |
| 172105 | RC-CHIP 1K J 1/8W /1206 | | R020 | R022 | | | |
| 172150 | RC-CHIP 1.5K %1 1/10W /0805 | | R617 | | | | |
| 172152 | RC-CHIP 1.5K J 1/10W /0805 | | R163 | R403 | R420 | R460 | R461 |
| 172225 | RC-CHIP 2.2K J 1/10W /0805 | | R445 | R138 | R239 | | |
| 172273 | RC-CHIP 2.7K J 1/10W /0805 | | R501 | R484 | | | |
| 172335 | RC-CIHP 3.3K J 1/10W /0805 | | R429 | R436 | R456 | R469 | R490 |
| 172394 | RC-CHIP 3.9K J 1/10W /0805 | | R503 | R217 | | | |
| 172474 | RC-CHIP 4.7K J 1/8W /1206 | | R030 | R031 | | | |
| 172475 | RC-CHIP 4.7K J 1/10W /0805 | | R455 | R129 | R405 | R164 | R418 |
| 172561 | RC-CHIP 5.6K J 1/10W /0805 | | R407 | R520 | | | |
| 172566 | RC-CHIP 5.6K J 1/8W /1206 | | R011 | | | | |
| 172683 | RC-CHIP 6.8K J 1/10W /0805 | | R155 | | | | |
| 172823 | RC-CHIP 8.2K J 1/10W /0805 | | R444 | | | | |
| 173101 | RC-CHIP 10K J 1/10W /0805 | | R404 | R413 | R430 | R434 | R447 |
| 173151 | RC-CHIP 15K J 1/8W /1206 | | R013 | | | | |
| 173154 | RC-CHIP 15K J 1/10W /0805 | | R219 | R213 | R220 | R408 | R159 |
| 173221 | RC-CHIP 22K J 1/10W /0805 | | R458 | R493 | R414 | R467 | R468 |
| 173273 | CFR-CHIP 27K J 1/10W /0805 | | R497 | | | | |
| 173333 | RC-CHIP 33K J 1/10W /0805 | | R402 | R446 | R101 | R102 | R135 |
| 173393 | RC-CHIP 39K J 1/10W /0805 | | R603 | | | | |
| 173562 | RC-CHIP 56K J 1/10W /0805 | | R507 | R508 | | | |
| 173682 | CFR-CHIP 68K J 1/8W /1206 | | R023 | R024 | R025 | R026 | |
| 174104 | RC-CHIP 100K J 1/10W /0805 | | R535 | R104 | | | |
| 174181 | RC-CHIP 180K J 1/8W /1206 | | R141 | | | | |
| 175102 | RC-CHIP 1M J 1/10W /0805 | | R406 | | | | |
| 175470 | RC-CHIP 4.7M J 1/10W /0805 | | R179 | | | | |
| 179001 | RC-CHIP 0R /0805 2*1.25 | | R107 | R109 | R172 | R103 | R131 |
| 179002 | RC-CHIP 0R /1206 | | C027 | | | | |
| 201124 | CC 120PF K 50V NPO R:5 | | C150 | | | | |
| 201222 | CC 220PF K 50V NPO R:5 | | C0003 | C0004 | | | |
| 201226 | CC 220PF K 2KV Y5P R:5 | | C622 | | | | |
| 201481 | CC 470PF K 2KV +15%, -30% 1 | | C618 | | | | |
| 201560 | CC 560PF K 50V R:5 | | C516 | | | | |
| 202105 | CC 1NF K 1KV Y5P R:5 | | C611 | C612 | | | |
| 202220 | CC 2.2NF M 250VAC Y5U R:10 | | C619 | | | | |
| 202221 | C-CE 2.2NF K 2KV Y5P R:7.5 | | C705 | | | | |
| 202225 | C-CE 2.2NF K 100V Y5P R:5 | | C506 | | | | |
| 202229 | CC 2.2NF K 500V Y5P R:5 | | C506 | | | | |

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|---|---|---|---|---|---|---|---|
| 203330 | C-PPM 33NF J 630V R:15 | | C615 | | | | |
| 250227 | EC 2.2UF 16V 11*5 R:5 | | C029 | C030 | | | |
| 250470 | EC 4.7UF 16V 11*5 R:5 | | C018 | C019 | C127 | C406 | |
| 251107 | EC 10UF M 16V 11*5 R:5 | | C023 | C025 | C103 | C214 | C401 |
| 251109 | EC 10UF 250V 16*10 R:5 | | C523 | C702 | C703 | | |
| 251478 | EC 47UF 16V 11*5 R:5 | | C502 | C633 | C634 | C427 | C429 |
| 252112 | EC 100UF 16V 11*6 R:5 | | C142 | | | | |
| 252229 | EC 220UF 16V 11*8 R:5 | | C104 | C631 | C123 | C513 | |
| 253101 | EC 1000UF 35V 25*13 R:5 | | C522 | | | | |
| 253106 | EC 1000UF 25V 20*13 R:5 | | C511 | C621 | | | |
| 271390 | C-PPM 390NF J 250V R:15 | | C515 | | | | |
| 272911 | C-PPM 9.1NF %3.5 1.5/1.6KV | | C518 | | | | |
| 273105 | C-PEM 10NF K 100V R:5 | | C503 | | | | |
| 273112 | C-PEM 10NF K 250 VAC R:10 | | C606 | | | | |
| 273225 | C-PEM 22NF J 63V R:5 | | C704 | | | | |
| 273333 | C-PEM 33NF K 100V R:5 | | C525 | | | | |
| 273471 | C-PEM 47NF K 63V R:5 | | C0001 | C0002 | | | |
| 274102 | C-PEM 100NF J 63V R:5 | | C101 | C102 | C405 | C524 | |
| 274103 | C-PEM 100NF K 275V-AC R:15 | | C607 | | | | |
| 274105 | C-PEM 100NF J 250V R:10 | | C701 | | | | |
| 274107 | C-PEM 100NF J 100V R:5 | | C521 | | | | |
| 274224 | C-PEM 220NF K 275V-AC R22. | | C605 | | | | |
| 274230 | C-PEM 220NF J 100V R:5 | | C527 | | | | |
| 274332 | C-PEM 330NF K 63V R:5 | | C501 | | | | |
| 290100 | CC-CHIP 10PF D 50V /0805 NP | | C130 | | | | |
| 290222 | CC-CHIP 22PF J 50V /0805 NP | | C133 | | | | |
| 290274 | CC-CHIP 27PF J 50V NPO 0805 | | C504 | | | | |
| 290334 | CC-CHIP 33PF J 50V /0805 NP | | C408 | C409 | C410 | | |
| 290561 | CC-CHIP 56PF J 50V NPO 0805 | | C138 | C610 | | | |
| 291103 | CC-CHIP 100PF J 50V /0805 N | | C419 | C437 | C438 | | |
| 291224 | CC-CHIP 220PF J 50V /1206 N | | C164 | | | | |
| 291225 | CC-CHIP 220PF K 50V /0805 X | | C145 | C414 | C415 | C203 | C122 |
| 291477 | CC-CHIP 470PF J 50V /0805 N | | C206 | C205 | | | |
| 291560 | CC-CHIP 560PF J 50V /0805 N | | C603 | | | | |
| 291822 | CC-CHIP 820PF J 50V /0805 N | | C402 | | | | |
| 292110 | CC-CHIP 1NF K 50V /0805 X7R | | C201 | C202 | C215 | C602 | C507 |
| 292151 | CC-CHIP 1.5NF K 50V /0805 X | | C601 | C139 | | | |
| 292223 | CC-CHIP 2.2NF K 50V /0805 X | | C424 | C166 | C609 | | |
| 293108 | CC-CHIP 10NF K 50V /0805 X7 | | C608 | C430 | C028 | C512 | C416 |
| 293230 | CC-CHIP 22NF K 50V /0805 X7 | | C417 | | | | |
| 293474 | CC-CHIP 47NF K 50V /0805 X7 | | C407 | C413 | C420 | C421 | C422 |
| 294109 | CC-CHIP 100NF K 50V /0805 X | | C017 | C021 | C024 | C026 | |
| 294111 | CC-CHIP 100NF K 25V /0805 X | | C120 | C125 | C152 | C432 | C433 |
| 294222 | CC-CHIP 220NF K 25V /1206 X | | C021 | | | | |
| 294231 | CC-CHIP 220NF K 16V /0805 X | | C124 | C141 | | | |
| 294476 | CC-CHIP 470NF K 16V /0805 X | | C151 | | | | |
| 300193 | DIODE Z. MTZJ9.1B | | ZD503 | | | | |
| 300305 | DIODE BA157 | | D502 | D504 | | | |
| 302289 | DIODE 1N4148 52MM | | D406 | D104 | | | |
| 302296 | DIODE 1N4148 26MM | | D401 | D402 | D403 | D405 | D505 |
| 302786 | DIODE Z. MTZJ6.2B | | ZD101 | | | | |
| 302948 | DIODE 1N4007 | | D701 | | | | |
| 303148 | DIODE-CHIP RB411D T146 | | D105 | | | | |
| 303195 | DIODE 4148 MELF | | D404 | D602 | | | |
| 303206 | DIODE RGP30MS | | D610 | | | | |
| 303209 | DIODE BAV21 | | D702 | D703 | D704 | | |
| 303217 | DIODE RGP10J | | D607 | | | | |
| 303227 | DIODE RGP15J | | D503 | | | | |
| 303308 | DIODE RF2007 | | D501 | D601 | D603 | D604 | D606 |
| 303771 | DIODE Z. UZT33V | | ZD601 | | | | |
| 303813 | DIODE RGP15D | | D609 | | | | |

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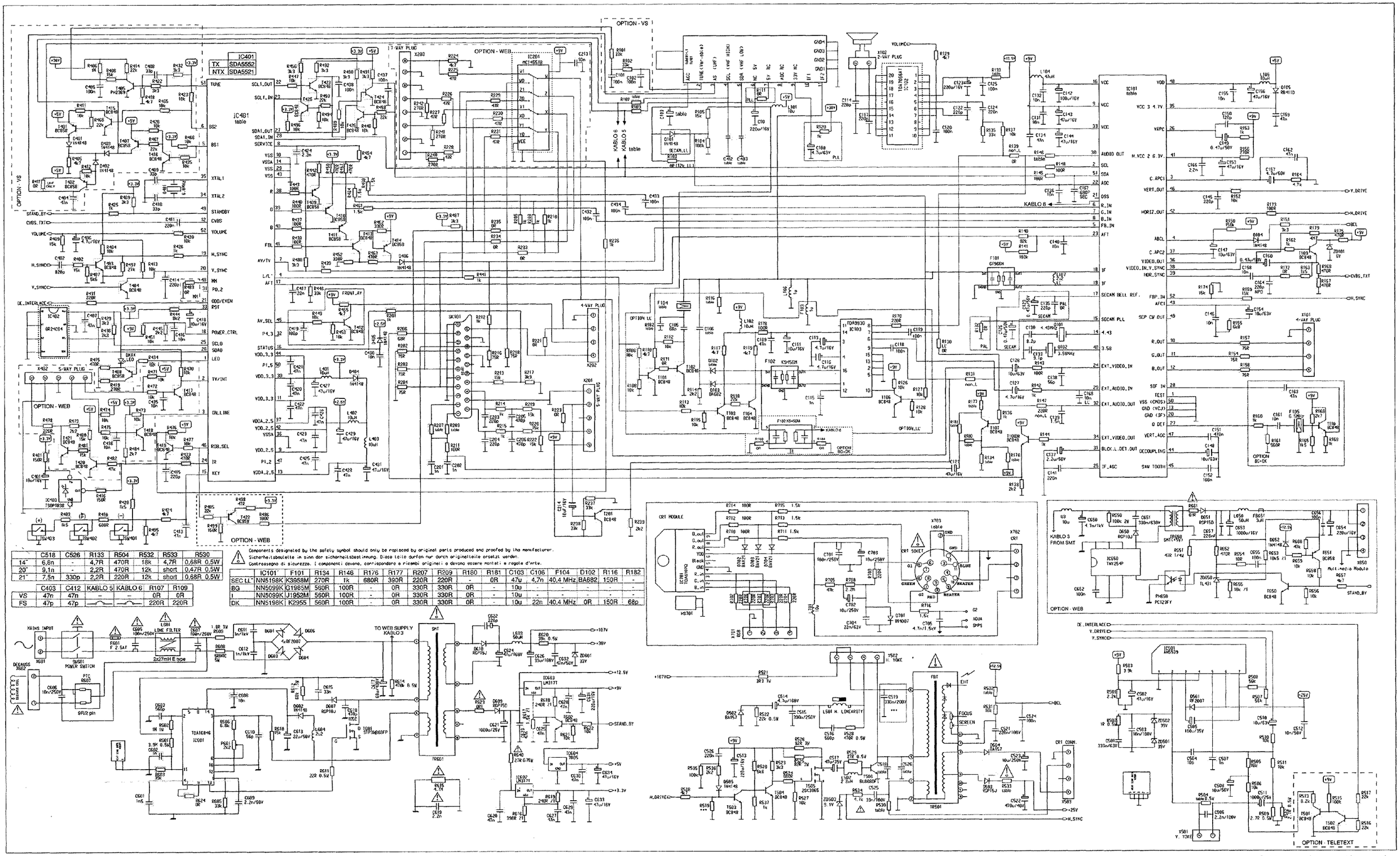
|---|---|---|---|---|---|---|---|
| 303814 | DIODE Z.MTZJ39B | | ZD501 | ZD502 | | | |
| 303850 | LED LTL 4263 RED L=25.4 | | LED | | | | |
| 303991 | LED IR SIR563SB3F 23/940 | | | | | | |
| 401141 | TRN-CHIP BC848B SOT23 | | T011 | T503 | T504 | T412 | T602 |
| 401142 | TRN-CHIP BC858B SOT23 | | T401 | T402 | T407 | T408 | T409 |
| 401193 | TRN-CHIP BC818-215 SOT23 | | | | | | |
| 401219 | TRN STP3NB60FP | | T601 | | | | |
| 401245 | TRN PH2369 | | T405 | | | | |
| 401331 | TRN-CHIP 2SK3065 | | T505 | | | | |
| 401332 | TRN BU808DFI | | T506 | | | | |
| 451517 | IC TDB7805CT T0220CASE | | IC604 | | | | |
| 451518 | IC KA317TU T0220CASE | | IC602 | IC603 | | | |
| 452272 | IC-CHIP 74HCT4053 | | IC010 | | | | |
| 452382 | IC-CHIP S3C1840DA9/SMB1 | | | | | | |
| 452510 | IC 4053B CMOS 16SOIC | | | | | | |
| 452521 | IR RECEIVER TSOP 1838 | | IC403 | | | | |
| 452597 | IC-CHIP TDA7056AT | | IC102 | | | | |
| 452746 | IC TDA6107Q | | IC701 | | | | |
| 452795 | IC TDA16846 | | IC601 | | | | |
| 452807 | IC SDA555XFL | | IC401 | | | | |
| 452808 | IC NN5099K | PAL | IC101 | | | | |
| 452810 | IC AN5539-LF | | IC501 | | | | |
| 452811 | IC NN5198K | PAL/SECAM | | | | | |
| 452837 | IC-CHIP BR24C04 (SOP8) | | IC402 | | | | |
| 458320-01 | IC SDA5521 (NTX) M.V1 | NON-TX | IC401 | | | | |
| 458640 | IC SDA5552 (TX) M.V1 | TX | IC401 | | | | |
| 6BZ107-AS | SPEAKER SM 16R/3W | | | | | | |
| 577167-AS | DEGAUSSING COIL 14" | 14" | | | | | |
| 620167-AS | DEGAUSSING COIL ASSY 20" BA | 20" | | | | | |
| 54C500 | CORD POWER | | | | | | |
| 7F5187 | RC LG 12.4/12.5 | 14", 20" | | | | | |

# 12.4/12.5 CTV CHASSIS

A99.820-03




| | C518 | C526 | R133 | R504 | R532 | R533 | R530 |
|---|---|---|---|---|---|---|---|
| 14" | 6,8n | - | 4,7R | 470R | 18k | 4,7R | 0,68R 0,5W |
| 20" | 9,1n | - | 2,2R | 470R | 12k | short | 0,47R 0,5W |
| 21" | 7,5n | 330p | 2,2R | 220R | 12k | short | 0,68R 0,5W |

| | C403 | C412 | KABLO 5 | KABLO 6 | R107 | R109 |
|---|---|---|---|---|---|---|
| VS | 47n | 47n | - | - | 0R | 0R |
| FS | 47p | 47p | | | 220R | 220R |

⚠ Components designated by the safety symbol should only be replaced by original parts produced and proofed by the manufacturer.
Sicherheitsbauteile im sinn der sicherheitsbestimmung. Diese teile dürfen nur durch originalteile ersetzt werden.
Contrassegno di sicurezza. I componenti devono, corrispondere a ricambi originali: e devono essere montati a regola d'arte.

| IC101 | F101 | R134 | R146 | R176 | R177 | R207 | R209 | R180 | R181 | C103 | C106 | F104 | D102 | R116 | R182 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SEC LL' | NN5168K | K3958M | 270R | 1k | 680R | 390R | 220R | 220R | - | 0R | 47u | 4,7n | 40,4 MHz | BA682 | 150R | - |
| BG | NN5099K | G1985M | 560R | 100R | - | 0R | 330R | 330R | 0R | - | 10u | - | - | - | - | - |
| I | NN5099K | J1952M | 560R | 100R | - | 0R | 330R | 330R | 0R | - | 10u | - | - | - | - | - |
| DK | NN5198K | K2955 | 560R | 100R | - | 0R | 330R | 330R | 0R | - | 10u | 22n | 40,4 MHz | 0R | 150R | 68p |

# 12.4/12.5 CTV CHASSIS

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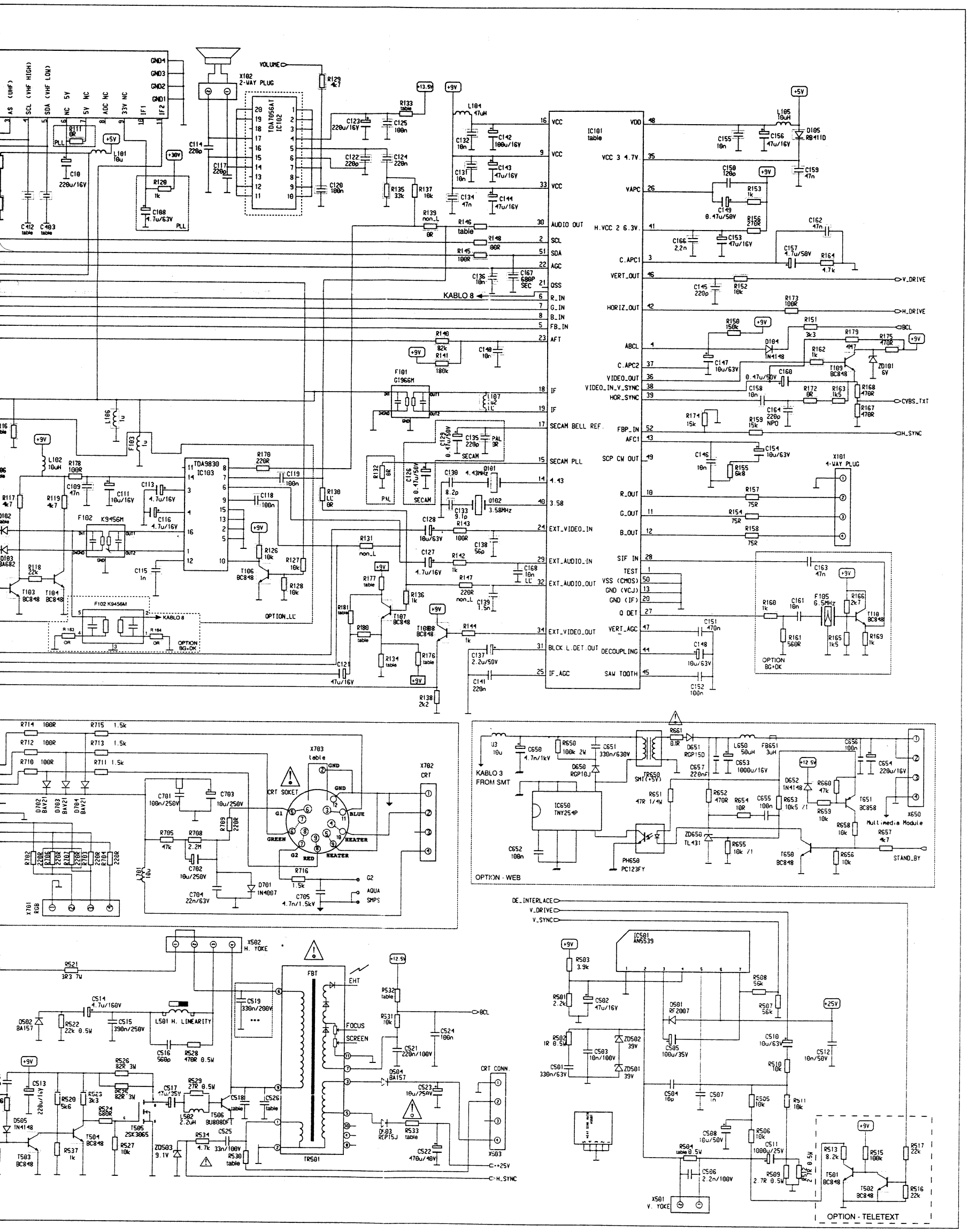
| | C518 | C526 | R133 | R504 | R532 | R533 | R530 |
|---|---|---|---|---|---|---|---|
| 14" | 6,8n | - | 4,7R | 470R | 18k | 4,7R | 0,68R 0,5W |
| 20" | 9,1n | - | 2,2R | 470R | 12k | short | 0,47R 0,5W |
| 21" | 7,5n | 330p | 2,2R | 220R | 12k | short | 0,68R 0,5W |

| | C403 | C412 | KABLO 5 | KABLO 6 | R107 | R109 |
|---|---|---|---|---|---|---|
| VS | 47n | 47n | - | - | 0R | 0R |
| FS | 47p | 47p | | | 220R | 220R |

Components designated by the safety symbol should only be replaced by original parts produced and proofed by the manufacturer.
Sicherheitsbauteile im sinn der sicherheitsbestimmung. Diese teile durfen nur durch originalteile ersetzt werden.
Contrassegno di sicurezza. I componenti devono, corrispondere a ricambi originali e devono essere montati a regola d'arte.

| | IC101' | F101 | R134 | R146 | R176 | R177 | R207 | R209 | R180 | R181 | C103 | C106 | F104 | D102 | R116 | R182 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SEC LL' | NN5198K | K3958M | 270R | 1k | 680R | 390R | 220R | 220R | - | 0R | 47u | 4,7n | 40,4 MHz | BA682 | 150R | - |
| BG | NN5099K | G1985M | 560R | 100R | - | 0R | 330R | 330R | 0R | - | 10u | - | - | - | - | - |
| I | NN5099K | J1952M | 560R | 100R | - | 0R | 330R | 330R | 0R | - | 10u | - | - | - | - | - |
| DK | NN5198K | K2955 | 560R | 100R | - | 0R | 330R | 330R | 0R | - | 10u | 22n | 40,4 MHz | 0R | 150R | 68p |




Subject to change without notice